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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/687,550

10/15/2003

Edward J. Seppi

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23639 7590 06/15/2006
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EXAMINER

MALEVIC, DJURA

ART UNIT	PAPER NUMBER
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2884

DATE MAILED: 06/15/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

H:A

Office Action Summary

Application No.

10/687,550

Applicant(s)

SEPPI ET AL.

Examiner

Djura Maljevic

Art Unit

2884

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
 Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 5/15/2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-40 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-40 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10/15/2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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Response to Amendment

The amendment filed 05/15/2006 was entered.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1 –3, 6, 9, 11 –13, 15, 16, 18, 21 –23, 25 –27, 29, 31, 32, 34, 35, 37, 38 and 40 are rejected under 35 U.S.C. 102(e) as being anticipated by Bogatu et al. (US Pub. 20020191751 A1)

Regarding claims 1 and 9, Bogatu discloses a detector array 22' (Fig. 8a – 8c) comprising scintillators with photo-multipliers [0032] featuring a checkerboard pattern [0045]. The said array 22' comprises a pair of detectors, such as detector 76a and detector 76b, positioned to receive filtered radiation from the pair of filters 32q and 34q, thus disclosing a plurality of first and second imaging elements having a first and second radiation detection characteristic. Note, it is to be appreciated that for each filter pair 32 and 34, a corresponding pair of detectors 76 produces two different electrical signals, one electrical signal for filtration with filter 32 and one electrical signal for filtration with filter 34 [0046]. Also, Bogatu discloses a filter pair using a specific contrasting agent having two different filters used to successively filter each beam on each path according to the K_{EDGE} . Specifically, a first filter that is greater and a second filter that is slightly less than the $K_{EDGE, CONTRAST AGENT}$, thus providing first radiation characteristic and second radiation characteristic striking the individual detectors.

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Regarding claim 2, Bogatu discloses that the detector comprises scintillators [0032].

Regarding claim 3, Bogatu discloses that the detector comprises photo-multipliers [0032].

Regarding claims 6 and 13, Bogatu discloses that the detector comprises first and second imaging elements arranged relative to each other in a checkerboard pattern [0046].

Regarding claims 11 and 16, Bogatu discloses that the detector array includes detectors 76a-76d... which produce an electrical signal proportional to the intensity of the radiation received above the $K_{EDGE, CONTRAST\ AGENT}$ and below the $K_{EDGE, CONTRAST\ AGENT}$ [0045 - 0046], thus disclosing a plurality of first and second detecting elements configured to generate signals in response to photons having first and second energy levels.

Regarding claim 12, Bogatu discloses a filter pair using a specific contrasting agent wherein the filter pair having two different filters used to successively filter each beam on each path according to the K_{EDGE} . Specifically, a first filter that is greater and a second filter that is slightly less than the $K_{EDGE, CONTRAST\ AGENT}$, thus providing first radiation characteristic above $K_{EDGE, CONTRAST\ AGENT}$ and second radiation characteristic below $K_{EDGE, CONTRAST\ AGENT}$.

Regarding claim 15, Bogatu discloses a detector (Fig. 8a-8c) comprising a plurality of first detecting elements and a plurality of second detecting elements (detectors 76a-76d...etc).

Regarding claim 18, Bogatu discloses a detector array 22' (Fig. 8a - 8c) comprising scintillators with photo-multipliers [0032] featuring a checkerboard pattern [0045]. The said photo-multipliers are configured to generate charges in response to radiation and the said array 22' comprises a pair of detectors, such as detector 76a and detector 76b, positioned to receive filtered radiation from a pair of filters 32q and 34q, thus disclosing a plurality of first and second imaging elements having a first and second radiation detection characteristic. Note, it is to be appreciated that for each filter pair 32 and 34, a

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Art Unit: 2884

corresponding pair of detectors 76 produces two different electrical signals, one electrical signal for filtration with filter 32 and one electrical signal for filtration with filter 34 [0046]. Also, Bogatu discloses a filter pair using a specific contrasting agent having two different filters used to successively filter each beam on each path according to the K_{EDGE} . Specifically, a first filter that is greater and a second filter that is slightly less than the $K_{EDGE, CONTRAST AGENT}$, thus providing first radiation characteristic and second radiation characteristic striking the individual detectors.

Regarding claims 21 and 22, Bogatu discloses a filter pair having two different filters used to successively filter each beam according to the K_{EDGE} . Specifically, a first filter that is greater and a second filter that is slightly less than the $K_{EDGE, CONTRAST AGENT}$, thus providing first radiation characteristic above $K_{EDGE, CONTRAST AGENT}$ and second radiation characteristic below $K_{EDGE, CONTRAST AGENT}$.

Regarding claims 23 and 25, Bogatu discloses that the detector comprises first and second imaging elements arranged relative to each other in a checkerboard pattern [0046], thus disclosing a plurality of detectors elements comprising first and second detector elements.

Regarding claim 26 and 27, Bogatu discloses that each detector is electrically wired to a computer to allow the signals generated by the detectors to be processed [0046].

Regarding claims 29 and 35, Bogatu discloses a detector array 22' (Fig. 8a – 8c) comprising scintillators with photo-multipliers [0032] and filters 32q and 34q, thus disclosing a plurality of first and second imaging elements having a first and second radiation detection characteristic. Note, it is to be appreciated that for each filter pair 32 and 34, a corresponding pair of detectors 76 produces two different electrical signals, one electrical signal for filtration with filter 32 and one electrical signal for filtration with filter 34 [0046].

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Art Unit: 2884

Regarding claims 31, 32, 37 and 38, Bogatu discloses a filter array arranged in an alternating checkerboard pattern [0045], thus disclosing a plurality of first and second regions.

Regarding claims 34 and 40, Bogatu discloses the filters and detectors aligned according to first and second photoconductors and filters (Fig. 8a – 8c).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 4, 5, and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bogatu in view of Green (US Pub. 20040174959 A1).

Regarding claims 4, 5 and 28, Bogatu discloses the invention according to claim 1 however, Bogatu does not expressly disclose the photoconductor element made from HgI_2 or PhI_2 . It would have been obvious to one having ordinary skill in the art at the time the invention was made to include a photoconductor comprising HgI_2 or PhI_2 , since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416. One would also have been motivated to include in Bogatu, a photoconductor comprising HgI_2 or PhI_2 as taught by Green [0063]. Green teaches that photoconductors may use conversion layers including HgI_2 or PhI_2 , since the materials demonstrate good wide band gap characteristics.

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Art Unit: 2884

5. Claims 7, 8, 14, 17, 20, 24, 33 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bogatu in view of Yamazaki et al. (US Patent 5,570,403).

Regarding claims 7, 8, 14, 17, 24, 33 and 39, Bogatu discloses the claimed invention according to claims 1, 9, 29, 31 and 37. Bogatu does not disclose the first and second imaging elements arranged in a plurality of lines positioned adjacent to one another. Yamazaki teaches an X-ray detection apparatus with varied energy level capability comprising alternating detector rows. It would have been obvious at the time the invention was made to one skilled in the art to modify Bogatu with alternating detector rows as taught by Yamazaki in order to acquire two sets worth of data.

Regarding claim 20, Bogatu discloses the claimed invention according to claim 18. Bogatu does not expressly disclose the photoconductor elements having different thickness. Yamazaki teaches two solid state detectors comprised of scintillators and photodiodes. Yamazaki goes on to teach that each energy characteristic detected by the detectors is differentiated from the other by varying the thickness of the scintillator in the detectors (Col. 6, Line 50).

It would have been obvious to one skilled in the art at the time the invention was made to modify Bogatu to include photoconductor elements having different thickness as taught by Yamazaki in order to detect each energy characteristic.

6. Claims 10 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bogatu in view of Brooks (US Patent 4,247,774).

Regarding claims 10 and 19, Bogatu discloses the invention according to claim 9. Bogatu does not expressly disclose that the first and second conversion elements are made from different scintillating materials. Brooks discloses a multi energy detector (Fig. 1) comprising two different materials for each detector to sense the different energies (Col.3, Line 39 – Col. 4, Line 34).

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It would have been obvious to one skilled in the art at the time the invention was made to modify Bogatu to conversion elements having different materials as taught by Brooks in order to detect each energy characteristic

7. Claims 30 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bogatu in view of Albagli (US Patent 6,418,193 B1).

Regarding claims 30 and 36, Bogatu discloses the invention according to claim 29. Bogatu does not expressly disclose the first and second filters prepared from a material selected from a group consisting of aluminum, copper, and molybdenum. It would have been obvious to one having ordinary skill in the art at the time the invention was made to include a filter comprising aluminum, copper, and molybdenum, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416. One would also have been motivated to include in Bogatu, a filter comprising aluminum, copper, and molybdenum as taught by Albagli (Col. 1, Line 12). Albagli teaches that aluminum, copper, and molybdenum are preferred materials for spectrum filters (Col. 1, Line 12).

Response to Arguments

8. Applicant's arguments filed 02/21/2006 have been fully considered but they are not persuasive.

With regards to claim 1, applicant suggests that filter set, filters 32 and 34, are not imaging elements that are part of the detector array. Bogatu does disclose (Figures 8a and 8b) a detection system that includes a one to one correspondence comprising filters 32 and 34 with detectors 76a and 76b, thus including a filter which "broadly speaking" is a component or part of the detector array, since the filter is integral to the detector's radiation detection. However, the claim recites a plurality of first and second imaging elements having first and second radiation detection *characteristics*. Referring to figures 8a, 8b

Art Unit: 2884

and 8c, filters 32 and 34 generates two different radiation characteristics and the detectors such as 76a and 76b both are aligned with the corresponding filter such as 32 and 34 comprising the said different characteristics. Since, the detectors detect different radiation characteristics coming from the corresponding filter, the detection system therefore includes first and second imaging elements (detectors 76a and 76b) having first and second radiation detection *characteristics* (detecting two different radiations passing through the filters 32 and 34 thus, 1st and 2nd radiation characteristics).

With regards to claim 9, applicant suggests that filter set, filters 32 and 34, are not imaging elements that are part of the detector array and the embodiment does not disclose or suggest a conversion layer configured to generate light photons in response to radiation. However, Bogatu does disclose, broadly speaking a detection system as discussed in examiners response with regards to claim 1 (above). Note, (referring to Paragraph 32) Bogatu discloses that the detectors may be solid-state detectors, gas-filled detectors or scintillators with photo-multipliers, thus disclosing a conversion layer configured to generate light photons in response to radiation, which takes account of all embodiments of the invention.

With regards to claim 18, see examiners response with regards to claim 9 (above).

With regards to claims 29 and 35, applicant suggests that the filter is not a component of the detector. However, (referring to Figure 8a and 8c) Bogatu does disclose a detection system that includes a one to one correspondence, which aligns filters 32 and 34 with detectors 76a and 76b, thus including a filter which "broadly speaking" is a component of a detector, since the filter is integral to the detector's radiation detection. Applicant also suggests that Bogatu does not disclose a photoconductor layer or a conversion layer. Bogatu does suggest that the detector array 22 consist of scintillators with photo-multipliers, which takes account of all embodiments of the present invention.

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Art Unit: 2884

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Djura Malevic whose telephone number is 571.272.5975. The examiner can normally be reached on Monday - Friday between 8:30am and 4:00pm.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Porta can be reached on (571) 272-2444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Art Unit: 2884

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Djura Malevic
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